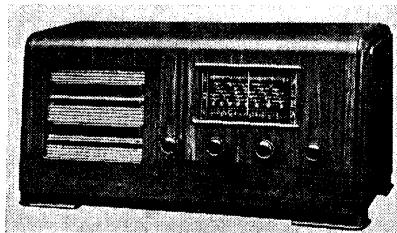


"TRADER" SERVICE SHEET

812

ALBA 474 & 461

A.C./D.C. 3-BAND SUPERHETS



The Alba 474 A.C./D.C. superhet.

THE Alba 474 is a 4-valve (plus rectifier) 3-band superhet designed for A.C. or D.C. mains of 200-250 V, 40-100 c/s in the case of A.C. The 461 A.C./D.C. employs a similar chassis.

Release date and original prices: 474, October, 1946; £18 18s plus £4 1s 4d p.t.; 461, August, 1946; £17 17s plus £3 16s 10d p.t.

CIRCUIT DESCRIPTION

Aerial input to single-tuned circuits, which precede a triode hexode valve (**V1**, **Mullard metallized CCH35**) operating as frequency changer with internal coupling.

Triode oscillator grid coils **L7** (S.W.), **L8** (M.W.) and **L9** (L.W.) are tuned by **C37**. Parallel trimming by **C38** (S.W.), **C39** (M.W.) and **C40** (L.W.); series tracking by **C11** (S.W.), **C12** (M.W.) and **C13** (L.W.). Reaction coupling by coils **L10** (S.W.), **L11** (M.W.) and **L12** (L.W.).

Second valve (**V2**, **Mullard metallized EF30**) is a variable-mu RF pentode operating as intermediate frequency amplifier.

Intermediate frequency 460 kc/s.

Diode second detector is part of double diode triode valve (**V3**, **Mullard metallized EBC33**). Audio frequency component in rectified output is developed across load resistor **R8** and passed via A.F. coupling capacitor **C22**, switch **S13** and manual volume control **R9** to control grid.

Second diode of **V3**, fed from **L16** via **C24**, provides D.C. potentials which are developed across load resistor **R12** and fed back through decoupling circuits as G.B. to F.C. (except on S.W.) and I.F. valves, giving automatic volume control. Delay voltage, together with fixed G.B. for **V1**, **V2** and **V3**, is obtained from the drop along **R6**, which is common to the cathode circuits of the three valves.

Resistance-capacitance coupling by **R10**, **C26** and **R13**, via grid stopper **R14**, between **V3** triode and pentode output valve (**V4**, **Mullard CL33**).

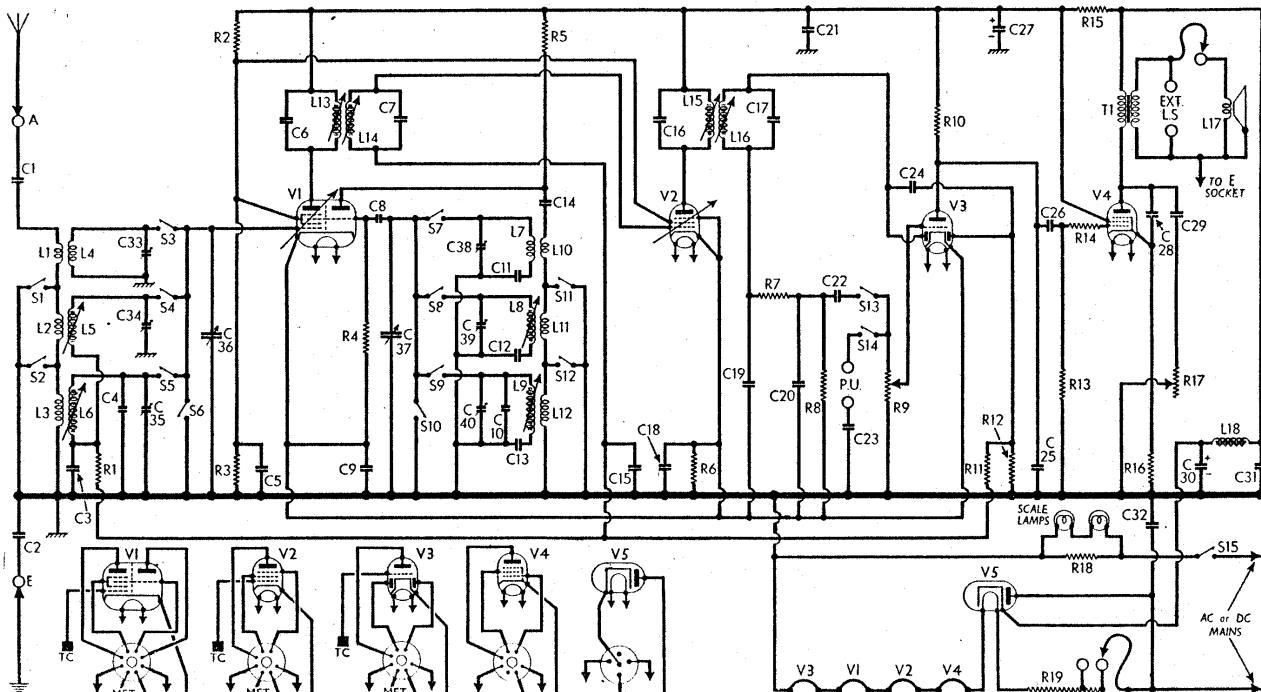
COMPONENTS AND VALUES

RESISTORS		Values (ohms)
R1	V1 hex. C.G. decoupling...	250,000
R2	{ V1, V2 S.G.'s H.T. feed ...	22,000
R3	{ potential divider ...	30,000
R4	V1 osc. C.G. resistor ...	47,000
R5	V1 osc. anode H.T. feed ...	27,000
R6	V1, V2, V3 fixed G.B. resistor ...	150
R7	I.F. stopper ...	47,000
R8	V3 signal diode load ...	470,000
R9	Manual volume control ...	1,000,000
R10	V3 triode anode load ...	47,000
R11	A.V.C. line decoupling ...	1,000,000
R12	V3 A.V.C. diode load ...	1,000,000
R13	V4 C.G. resistor ...	560,000
R14	V4 grid stopper ...	47,000
R15	H.T. smoothing resistor ...	1,500
R16	V4 G.B. resistor ...	150
R17	Variable tone control ...	50,000
R18	Scale lamp shunt ...	40
R19	Heater ballast resistor ...	700*

* Tapped at 600 Ω + 100 Ω from V5 heater.

CAPACITORS		Values (μ F)
C1	Aerial series capacitor ...	0.0002
C2	Earth isolator ...	0.05
C3	V1 hex. C.G. decoupling ...	0.05
C4	Aerial L.W. fixed trimmer	0.000056
C5	V1, V2 S.G.'s decoupling ...	0.1
C6	{ 1st I.F. transformer fixed ...	0.0001
C7	{ tuning capacitors ...	0.0001
C8	V1 osc. C.G. capacitor ...	0.000047
C9	V1 cathode by-pass ...	0.1
C10	Osc. L.W. fixed trimmer ...	0.00056
C11	Osc. circ. S.W. tracker ...	0.0056
C12	Osc. circ. M.W. tracker ...	0.000575
C13	Osc. circ. L.W. tracker ...	0.0002
C14	V1 osc. anode coupling ...	0.0001
C15	A.V.C. line decoupling ...	0.05
C16	{ 2nd I.F. transformer fixed ...	0.0001
C17	{ tuning capacitors ...	0.0001
C18	V1, V2, V3 cathode by-pass ...	0.5 *
C19	{ I.F. by-pass capacitors ...	0.0001
C20	H.T. circuit R.F. by-pass ...	0.1
C21	A.F. coupling to V3 C.G. ...	0.005
C22	Pick-up isolator ...	0.25
C23	V3 A.V.C. diode coupling ...	0.0002
C24	I.F. by-pass ...	0.0002
C25	A.F. coupling to V4 C.G. ...	0.01
C26	H.T. smoothing capacitor ...	16.0
C27*	A.F. coupling to V4 C.G. ...	0.005
C28	H.T. smoothing capacitor ...	0.005
C29	Fixed tone corrector ...	0.05
C30*	Part variable tone control ...	8.0
C31*	{ H.T. smoothing capacitors ...	16.0
C32	Mains R.F. by-pass ...	0.05
C33†	Aerial circ. S.W. trimmer ...	0.00005
C34†	Aerial circ. M.W. trimmer ...	0.00005
C35†	Aerial circ. L.W. trimmer ...	0.00005
C36†	Aerial circuit tuning ...	0.0005
C37†	Oscillator circuit tuning ...	0.0005
C38†	Osc. circ. S.W. trimmer ...	0.00005
C39†	Osc. circ. M.W. trimmer ...	0.00005
C40†	Osc. circ. L.W. trimmer ...	0.00005

* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Alba 474 and 461 A.C./D.C. superhets.

A common cathode circuit is used for **V1**, **V2** and **V3**.

OTHER COMPONENTS		APPROX. VALUES (ohms)
L1	Aerial S.W. coupling coil	0.2
L2	Aerial M.W. coupling coil	0.8
L3	Aerial L.W. coupling coil	85.0
L4	Aerial S.W. tuning coil	0.1
L5	Aerial M.W. tuning coil	3.0
L6	Aerial L.W. tuning coil	19.5
L7	Osc. S.W. tuning coil	0.2
L8	Osc. M.W. tuning coil	1.8
L9	Osc. L.W. tuning coil	4.8
L10	Osc. S.W. reaction coil	0.4
L11	Osc. M.W. reaction coil	1.1
L12	Osc. L.W. reaction coil	2.4
L13	{ 1st I.F. trans. { Pri. ...	9.0
L14	{ Sec. ...	9.0
L15	{ 2nd I.F. trans. { Pri. ...	6.0
L16	{ Sec. ...	6.0
L17	Speaker speech coil	2.0
L18	H.T. Smoothing choke	200.0
T1	Output { Pri. ...	370.0
	{ Sec. ...	0.25
S1-S14	Waveband switches	—
S15	Mains switch, ganged R17	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver. Voltages were measured on the 400 v scale of a model 7 Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 CCH35	{ 187 Oscillator 84	{ 1.65 3.8	77	1.5
V2 EFB39	187	4.5	77	1.3
V3 EBC33	97	1.7	—	—
V4 CL33	202	42.5	187	5.1
V5 ID5†	—	—	—	—

† Cathode to chassis, 232 V, D.C.

DISMANTLING THE SET

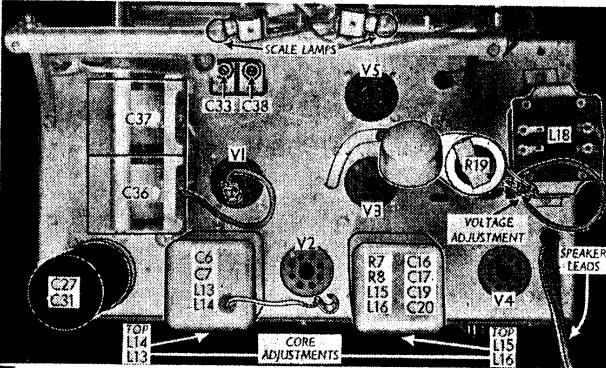
Removing Chassis.—Remove the control knobs (recessed grub screws) and the four chassis fixing screws, and unsolder the speaker leads; tilt rear of chassis and lift out.

When replacing, connect the speaker leads as follows, numbering the tags on the connecting panel from top to bottom; 1, brown; 2, red; 3, white; 4, blue; 5, yellow.

Removing tuning assembly.—Unsolder from the seven tags on the assembly the leads connecting it to chassis, also the systoflex covered wire going to the right-hand tag on the volume control and the braided earthing lead which joins a "star" tag to the right of the assembly.

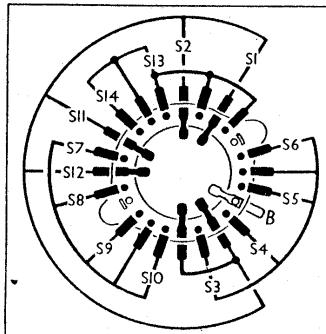
Switch set to S.W. and loosen the grub screw of the waveband indicator operating arm, and

Plan view of the chassis. The positions of the I.F. transformer core adjustments are approximately indicated. Several components are housed in the 2nd I.F. can.



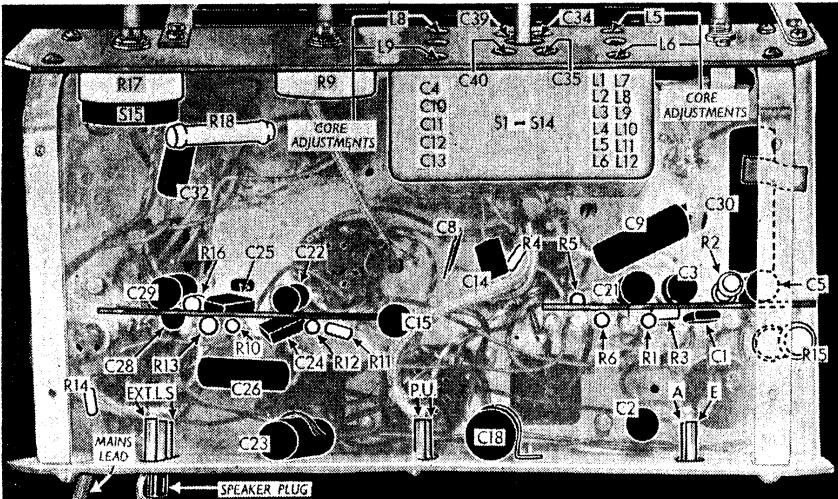
slide the arm off the waveband switch spindle; remove the four cheese-head screws (with lock washers) securing the tuning assembly to the front chassis member, and lift out the assembly.

When replacing, the heads of the two trimmers



The switch unit, as seen from the rear.

(C33, C38) should project through the hole in the chassis deck. Connect the leads to the tuning assembly as follows, numbering the tags from left to right: 1, to C8 and C37; 2, to C14; 3, screened lead to "live" P.U. socket; 4, screened lead to C22; 5, to C1; 6, to the junction of R1 and C3; 7, to C36. The systoflex covered lead emerging from the front of the assembly goes to the right-hand tag on the volume control, to the right-hand tag on the volume control,



Under-chassis view. The tuning assembly is the large unit seen at about top centre.

and the braided earthing lead should be soldered to the "star" tag to the right of the tuning assembly.

GENERAL NOTES

Tuning Assembly.—This contains all the R.F. and oscillator coils L1-L12 and associated trimmers and trackers, together with the waveband switch unit S1-S14. Instructions for removing and replacing the assembly are given under "Dismantling the Set."

Switches.—S1-S14 are the waveband and pick-up switches, ganged in a single rotary unit in the tuning assembly. In the diagram in col. 2, the unit is drawn in detail as seen when the cover is removed from the tuning assembly, and the latter is inverted, as seen in our under-chassis view. The table gives the switch positions for the four control settings, starting from the anti-clockwise position of the control. A dash indicates open, and C closed.

Scale Lamps.—These are two Osram M.E.S. type lamps, rated at 4 V, 0.3 A.

External Speaker.—Two sockets are provided at the rear of the chassis for a low impedance (2.5Ω) external speaker. A plug and socket device permits the internal speaker to be muted.

Switch	S.W.	M.W.	L.W.	Gram.
S1	C	—	—	—
S2	—	C	—	—
S3	—	—	C	—
S4	—	—	—	C
S5	—	—	—	—
S6	—	—	—	—
S7	C	—	—	—
S8	—	C	—	—
S9	—	—	C	—
S10	—	—	—	C
S11	C	—	—	—
S12	—	C	—	—
S13	C	—	C	—
S14	—	—	—	C

CIRCUIT ALIGNMENT

I.F. Stages.—Connect signal generator leads to control grid (top cap) of V1 and chassis, turn the volume control to maximum, feed in a 460 kc/s (652.1 m) signal, and adjust the cores of L13, L14, L15 and L16 for maximum output.

R.F. and Oscillator Stages.—With the gang at maximum, pointer should coincide with the high wavelength ends of the scales. Transfer signal generator leads, via a suitable dummy aerial, to A and E sockets.

M.W.—Switch set to M.W., tune to 215 m on scale, feed in a 215 m (1.396 Mc/s) signal, and adjust C39, then C34 for maximum output. Tune to 500 m on scale, feed in a 500 m (600 kc/s) signal, and adjust the cores of L8 and L5 for maximum output. Check L8 at 350 m (857 kc/s) for correct calibration, and repeat the C39, C34 adjustments if necessary.

S.W.—Switch set to S.W., tune to 18 m on scale, feed in an 18 m (16.67 Mc/s) signal, and adjust C38, then C33, for maximum output.

L.W.—Switch set to L.W., tune to 1,000 m on scale, feed in a 1,000 m (300 kc/s) signal, and adjust C40, then C35, for maximum output. Tune to 1,900 m on scale, feed in a 1,900 m (157.9 kc/s) signal, and adjust the cores of L9 and L6 for maximum output. Check the settings of C40, C35.